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ABSTRACT

Differences were compared in the short-term and long-term responses of subjects with headache, insomnia, or hypertension to biofeedback training, relaxation, or a combination of both. Headache sufferers, insomniacs, and hypertensives were randomly assigned in equal numbers to biofeedback, relaxation training or a record-keeping control. Over 2 months, controls received a combination of biofeedback and relaxation training in 15-20 individual hour sessions. Follow-up occurred one year later. Headache subjects showed some improvement in symptoms and medication use after all types of training. On average headache pain per week, both relaxation and biofeedback trainees improved relative to controls. At follow-up, all trained groups showed further lessening of headache activity below post-training levels; medication consumption also generally continued to decline. There were no significant differences between the improvements of the training groups, post-training or at follow-up. Insomniacs showed significant improvement after all types of training in sleep onset, and some decrease in medication use. At follow-up, biofeedback trainees showed continued improvement in sleep onset while relaxation trainees did not, with combination-trained subjects in between. (Author)

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LONG-TERM PSYCHOSOMATIC EFFECTS OF BIOFEEDBACK VS. RELAXATION TRAINING[1]

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Abstract: Eighteen subjects suffering from headaches, 18 insomniacs and 18 hypertensives were randomly assigned in equal numbers to biofeedback, relaxation training or a record-keeping control. After 2 months, controls received a combination of biofeedback and relaxation training. All training involved 15 to 20 individual hour sessions over 2 months. Follow-up occurred one year later.

Headache subjects showed some improvement in symptoms and medication use after all types of training. On average headache pain per week, biofeedback trainees improved relative to controls ($F = 3.85$, $p < .10$, 2-tailed), as did relaxation trainees ($F = 5.58$, $p < .05$). At follow-up, all (trained) groups showed further lessening of headache activity below post-training levels; medication consumption also generally continued to decline. There were no significant differences between the improvements of the training groups, post-training or at follow-up.

Insomniacs showed significant improvement after all types of training in sleep onset, and some improvement in medication use. At follow-up, biofeedback trainees showed continued improvement in sleep onset while relaxation trainees did not ($F = 3.77$, $p < .10$), with combination-trained subjects in between.

No hypertensive training group showed decreases in blood pressure any larger than the decreases due to habituation to the lab observed in the controls.

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This study undertook to compare differences in the short-term and the long-term response of subjects with headache, insomnia or hypertension to biofeedback training, relaxation or a combination of both.

Method: Eighteen subjects suffering from headache, 18 insomniacs and 18 hypertensives were selected on a first-come, first-served basis from a large number of volunteers and referrals. All subjects either had a check-up recently before the study with their physician regarding their problem, or had one at the beginning of the study. It was emphasized that subjects should continue to consult with their physician regarding any possible physical basis for their disorder, and follow his recommendations regarding pharamacological and medical treatment of their symptoms. All subjects were given the Cattell 16 PF Test, the Rotter I-E Scale, and a symptom history interview including a drug use section adopted from Blum and associates. Equal numbers of subjects in each symptom category were then assigned to biofeedback training, relaxation training or a record-keeping control group. After 2 months, the control group received a combination of biofeedback and relaxation training. All training involved 15 to 20 individual hour sessions over 2 months. Biofeedback included training in frontal muscle tension, skin resistance and electroencephalographic alpha rhythms. Relaxation training included progressive relaxation and autogenic training. Follow-up occurred one year later.

For 3 weeks just prior to and just after training periods: headache subjects kept hourly records of headache pain; insomniacs kept daily records of sleep disturbance; all subjects kept daily records of medication use. Hypertensives had their blood pressure checked 3 times before each training session; the average of the first 5 sessions served

as the pre-training score, and the average of the last 5 sessions as the post-training score. The same records were kept on all subjects for 3 weeks during the follow-up. Distributions for dependent variables were checked for normality with the Shapiro-Wilk test; where appropriate, log conversions were performed. Between group differences were assessed with the Werts-Linn regression form of ANCOVA, within group differences with the t-test for related samples.

Results: Headache subjects reported having symptoms for an average of 16.1 years; insomniacs for 17.6 and hypertensives 12.4. Hypertensives tended to be older (average age 54.7) than insomniacs (44.9) or headache subjects (38.9). Hypertensives tended to take more pills per week (average 33.4) than insomniacs (13.3) or subjects with headache (19.9). Hypertensives were more likely to have experienced a worsening of symptoms in the last year than insomniacs or subjects suffering from headache ($F = 3.38$, $p < .05$, 2-tailed). Sex ratios, educational levels, and occupational prestige ratings were similar in all 3 groups (there was a non-significant tendency for insomniacs to come from slightly lower educational levels but to be in somewhat more prestigious occupations). On the Cattell 16 PF, headache subjects tended to be higher on Conscientiousness (6.3) than insomniacs (5.6) or hypertensives (4.6) ($F = 2.86$, $p < .10$), while on the summary scale for Anxiety headache subjects (7.4) and insomniacs (7.3) were higher than hypertensives (4.6) ($F = 3.99$, $p < .05$). Similar findings occurred on the separate scales for Apprehension and Tension. On the Rotter I-E Scale, headache subjects were more external (11.0) than insomniacs (7.6) or hypertensives (8.8) ($F = 3.74$, $p < .05$).

Some improvement was observed in the symptoms of the headache

subjects after all types of training. On average headache pain per week, biofeedback trainees improved relative to controls ($F = 3.85$, $p < .10$; all p values are 2-tailed), as did relaxation trainees ($F = 5.58$, $p < .05$). Relaxation trainees also showed a drop in kinds of headache relevant medication taken per week compared to controls ($F = 9.00$, $p < .05$). At year 1 follow-up, all (trained) groups showed further lessening of headache activity below post-training levels. Medication consumption also generally continued to decline. There were no significant differences between the improvements of the training groups, post-training or at follow-up.

Insomniacs showed significant improvement after all types of training in sleep onset time (biofeedback group vs. controls, $F = 5.96$, $p < .05$; relaxation group vs. controls, $F = 6.45$, $p < .05$; combination-trained within group change $t = 2.47$, $p = .06$). Relaxation trainees also showed a drop in kinds of insomnia-relevant medication taken as compared to controls ($F = 7.00$, $p < .05$), and combination-trainees showed significant decreases in this variable as well ($t = 2.80$, $p < .05$). At follow-up biofeedback trainees showed continued improvement in sleep onset time while relaxation trainees did not ($F = 3.77$, $p < .10$), with combination-trainees in between. Otherwise, there were no significant differences in effects observed in the trained groups. Follow-up medication consumption was generally similar to post-training levels.

No hypertensive training group showed decreases in blood pressure any larger than the decreases due to habituation to the lab observed in the controls.

The large majority of subjects at follow-up told us they were still practicing and enjoying home exercises based on their training.

Discussion: In the short-term, headache subjects responded well to all types of training. Further declines in headache at follow-up were attributed by subjects to continued practice of home exercises; but it is also possible these declines were due to a general tendency for headaches to ameliorate with age.

Insomniacs also responded well to all types of training in the short-term, but over the long-term insomniacs appeared better able to strengthen biofeedback-based self-governance skills, while relaxation exercises showed some decrease in efficacy. Possibly the higher internality of the insomniacs played a role in this process.

Results on hypertensives highlight the evaluative problems introduced by psychophysiological habituation to a laboratory setting. Still, it is worth noting combination-trained subjects did show some sizable decreases in blood pressure during training even after the two-month habituation period they served as controls. (Blood pressure decreased from an average of 157/99 mmHg to 149/89 in the control period, and then from 141/86 to 138/82 during their training. Both changes in diastolic pressure were significant at less than the .10 level.) In addition, it is also worth noting the training techniques here did not employ the apparently more potent respiration techniques recently developed by Stone & deLeo, Benson, and Patel.